# DR. LOUIS C. MARQUET
# Director

**CECOM Research, Development and Engineering Center**
**U.S. Army Communications-Electronics Command**
**Fort Monmouth, New Jersey**

As Director of the Research, Development and Engineering Center (RDEC), U.S. Army Communications-Electronics Command (CECOM) since 1997, Dr. Louis C. Marquet is responsible for planning, directing and executing research and development programs in all areas of information technology, including: Command and Control, Communications, Computers, Intelligence (C4I); Night Vision and Electro-Optics; Countermine; Intelligence and Information Warfare (I2W); Power Sources and Management; and Horizontal Technology Integration. He is responsible for identifying, evaluating, developing and adapting advanced information and digital technologies emerging from industry, DARPA, the service research labs, and international partners. He provides the "technical bridge" between the Army Battle Labs, the basic research world, and the PEO/PM production programs, thereby facilitating the rapid insertion of new technology into the operational force to achieve information dominance as the Army undergoes a fundamental transformation from the industrial age to an information age Objective Force.

Dr. Marquet served in 1996-1997 as the Director of the CECOM RDEC Night Vision and Electronic Sensors Directorate (NV/ESD), where he was responsible for all Army electronic sensor technology and systems development, to include infrared sensors and focal plane array technology, optical device development, image processing and modeling and tactical lasers. Additionally, his responsibilities included other sensor activities such as radar, sensor fusion, Aided Target Recognition (ATR), combat ID, platform protection, radiac, countermine detection and neutralization, counter-surveillance and deception, and physical security.

From 1993 to 1996, Dr. Marquet served as Assistant Deputy Under Secretary of Defense for Advanced Development, working in the Office of the Under Secretary of Defense for Acquisition and Technology. His responsibilities included development and oversight of Advanced Concept Technology Demonstration (ACTD) programs, with specific interests in counter-proliferation, non-lethal weapons, modeling and simulation for Synthetic Theater of War (STOW), joint countermine warfare, sensors and directed energy systems.

Prior positions he has held include: Vice President for Directed Energy and Deputy to the Chief Technology Officer at the Nichols Research Corporation; Deputy for Technology at the Strategic Defense Initiative Organization (SDIO, now BMDO); Director of the Directed Energy Office at DARPA, and Associate Head of the Optics Division at MIT Lincoln Laboratory, starting there as a member of the technical staff.

He received his Bachelor of Science degree from Carnegie Tech (now Carnegie-Mellon University) and a Master of Science Degree and PhD in physics from the University of California. After serving two years active duty with the U.S. Army (Signal Corps), attached to NASA Goddard Space Flight Agency, Solar Physics Group, he became an Assistant Professor of Physics and Astronomy at the University of Arizona, Tucson, where he taught graduate and undergraduate courses and conducted research in Ionic Beam spectroscopy.

Dr. Marquet has received numerous official awards and recognition, to include the Office of the Secretary of Defense Meritorious

# Research, Development and Engineering Center Contract Opportunities

**Presented by: Dr. Louis C. Marquet**
**Director**
**7 May 02**
**(732) 427-2686**
**Email:**
**Louis.Marquet@mail1.monmouth.army.mil**

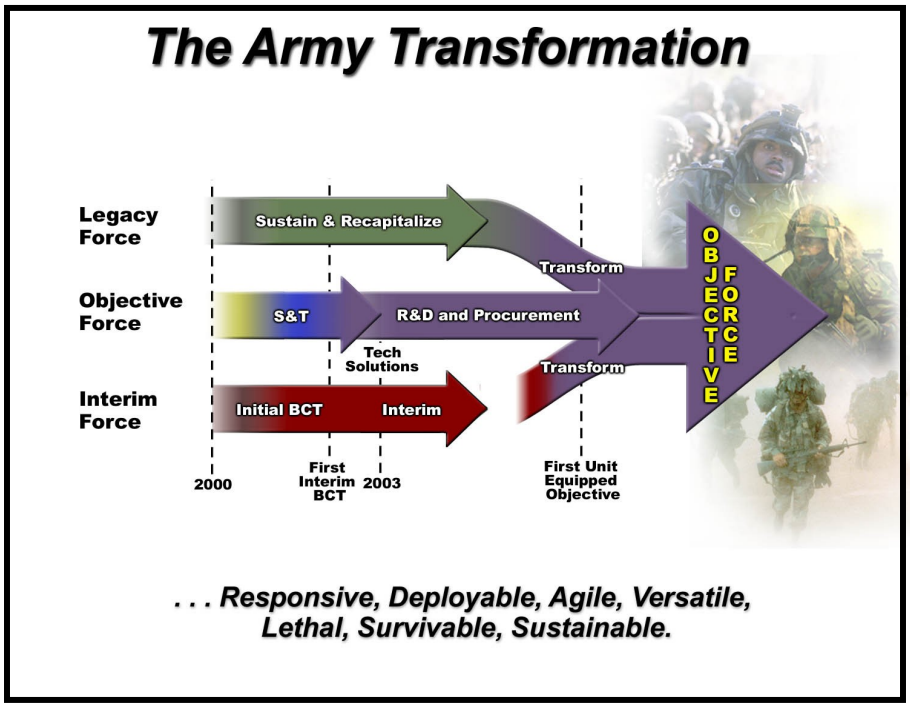
# RDEC Mission

- Identify, develop, evaluate and tailor emerging Information Technologies.
- Facilitate the transition of selected technologies into operational systems.
- Perform and Promote System of Systems Integration.

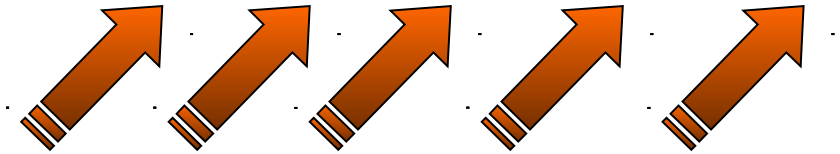
**To Achieve & Maintain Information Dominance**

**ECOM Bottom Line: THE WARFIGHTE**

# A View of the Future




- **The Warfighter's demand for more and better C4ISR will continue to grow.**
- **Commercial C4ISR technology will continue to rapidly advance.**
- **Our adversaries <u>WILL</u> have the latest technologies.**



**C3 Technology Insertion**



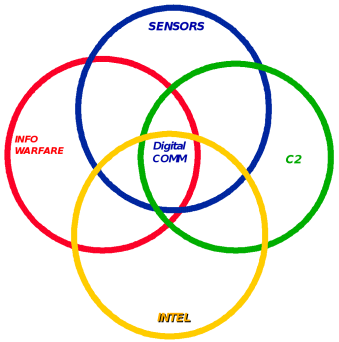
**ECOM Bottom Line: THE WARFIGHTE**

# CECOM RDEC Technology Needs

## RESEARCH, DEVELOPMENT & ENGINEERING CENTER

Dr. Louis C. Marquet - Director

Mr. Robert Doto




### Night Vision Electronic & Sensors

- Thermal Imaging
- Image Intensification
- Charge Couple Devices
- Image Fusion
- Sensor Fusion
- Advanced Optics
- High Density Processors
- Aided Target Recognition
- Lasers/Laser Radar
- Deception
- Countermine Science & Tech

### Space & Terrestrial Communications

- Secure On-The-Move Networking
- Reachback/Range Extension
- Unattended Sensors Networking
- Secure Personal Communications
- Antennas
- Information Assurance
- Networked Fires
- Cross Functional Technologies

### Command & Control

- Agile Commander
- Logistics C2
- Dismounted Warrior C2
- Interactive Speech
- Natural Language Processing / Translation
- Visual Displays
- Clock / Oscillator
- Power Sources
- Prototype Development & Platform Integration

### Intelligence & Information Warfare

- Collection Systems
- Signal Intelligence
- Direction Finder
- Emitter Intercept
- Electronic Intelligence
- Measurement & Signature Intel
- Electronic Warfare
- Radar Technology & Systems
- Information Operations Attack
- Information Processing, Dissemination & Display
- Modeling and Simulation
- C4ISR Penetration Test & Vulnerability

**ECOM Bottom Line: THE WARFIGHTE**

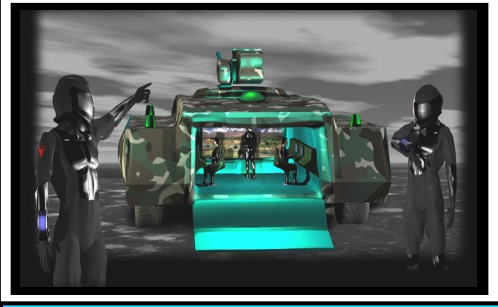
# CECOM RDEC Business Areas
## Providing Required Capabilities for Warfighters

***Business Areas***

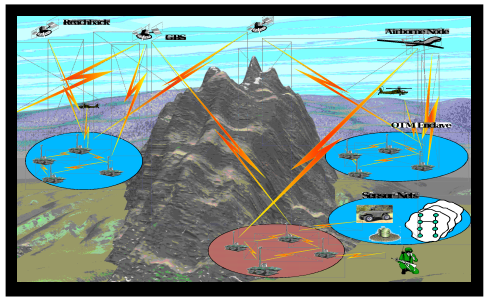
- Survivability
- Own the Night
- Own the Spectrum
- Know the Enemy
- Planning & Decision Making
- Secure Network Communications
- Information Assurance
- Situation Awareness
- Logistics Visibility
- Reduced Fratricide
- C2 Protect/Attack
- Counter Mine
- COA Analysis
- Combat ID

**Sensors**

**Command & Control**

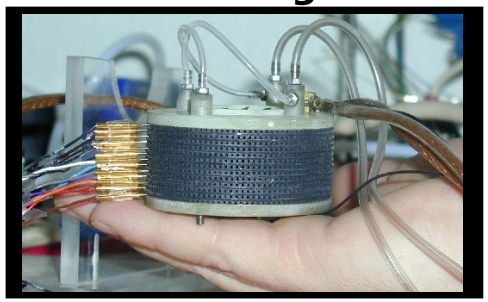


**Communications**



**Info Warfare**

**Power Management**



**C4ISR Capabilities For the Warfighter**

**Totally Integrated Solutions**

# CECOM INDEPENDENT RESEARCH & DEVELOPMENT (IR&D) PROGRAM

## Objective:

**Promote communication with Industry about CECOM plans and activities and technology needs to assist Industry in implementing their IR&D program.**

**Promotes effective use of IR&D accomplishments**

## Mechanisms:

**Technology Needs Development**

**Review of Industry IR&D Project Summaries on DTIC Database**

**Technical Interchange Meetings**

**One-on-Ones**

**Feedback**

## Process

Technology Needs Outreach to Industry
Review of Industry IR&D Defense Technical Info Database
Technology Interchange Meeting / One-on-One
Feedback to Government or Industry
Focused IR&D
Leverage of IR&D
Technology Forecast and Needs Development

**CECOM Bottom Line: THE WARFIGHTE**

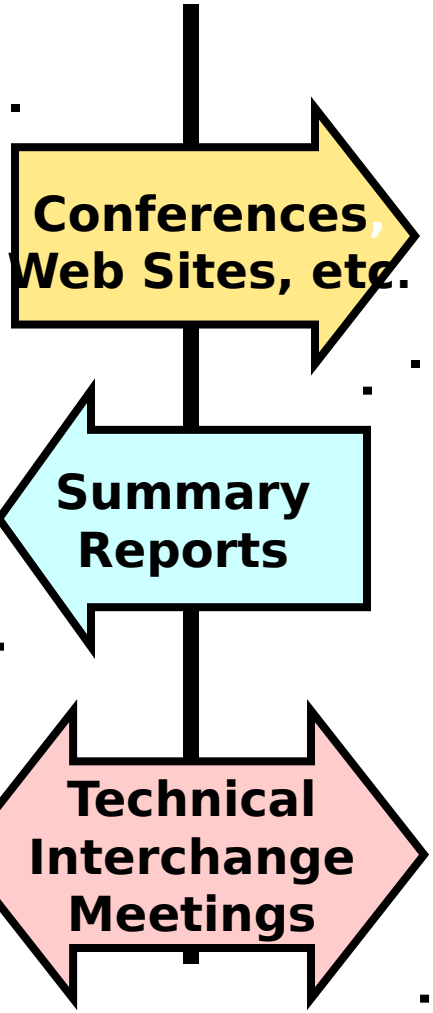
# DoD/Industry Interaction

## DoD

**Provide information on DoD's R&D activities & plans, mission needs, & operational requirements**

**Review IR&D database to identify IR&D of interest**

**Review IR&D activities and provide feedback to contractors**




## Industry

**Plan, fund, and conduct IR&D**

**Provide IR&D Project Descriptions**

**Provide technical information about IR&D**

**ECOM Bottom Line: THE WARFIGHTE**

# C4ISR Acquisition Philosophy

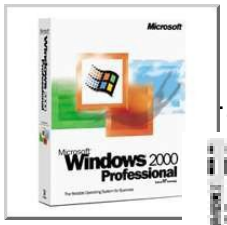
Adopt Commercial off the shelf Technology / Products

Adapt Commercial Technology / Products When It Cannot Be Directly Inserted

Develop Technology in Concert With Other Services and Agencies for Unique Areas And Partnerships, Alliances, Teaming

**ECOM Bottom Line: THE WARFIGHTE**

# C4ISR Development - Adopt, Adapt, Develop for Land Warrior

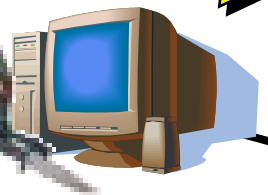


Adopt

SOLARIS™

JAVA

Adapt



Land Warrior Soldier Digitization Integrated Into Army Standard Loadbearing (MOLLE)

Thermal Weapon Sight

Develop

***INTEGRATED SYSTEM***

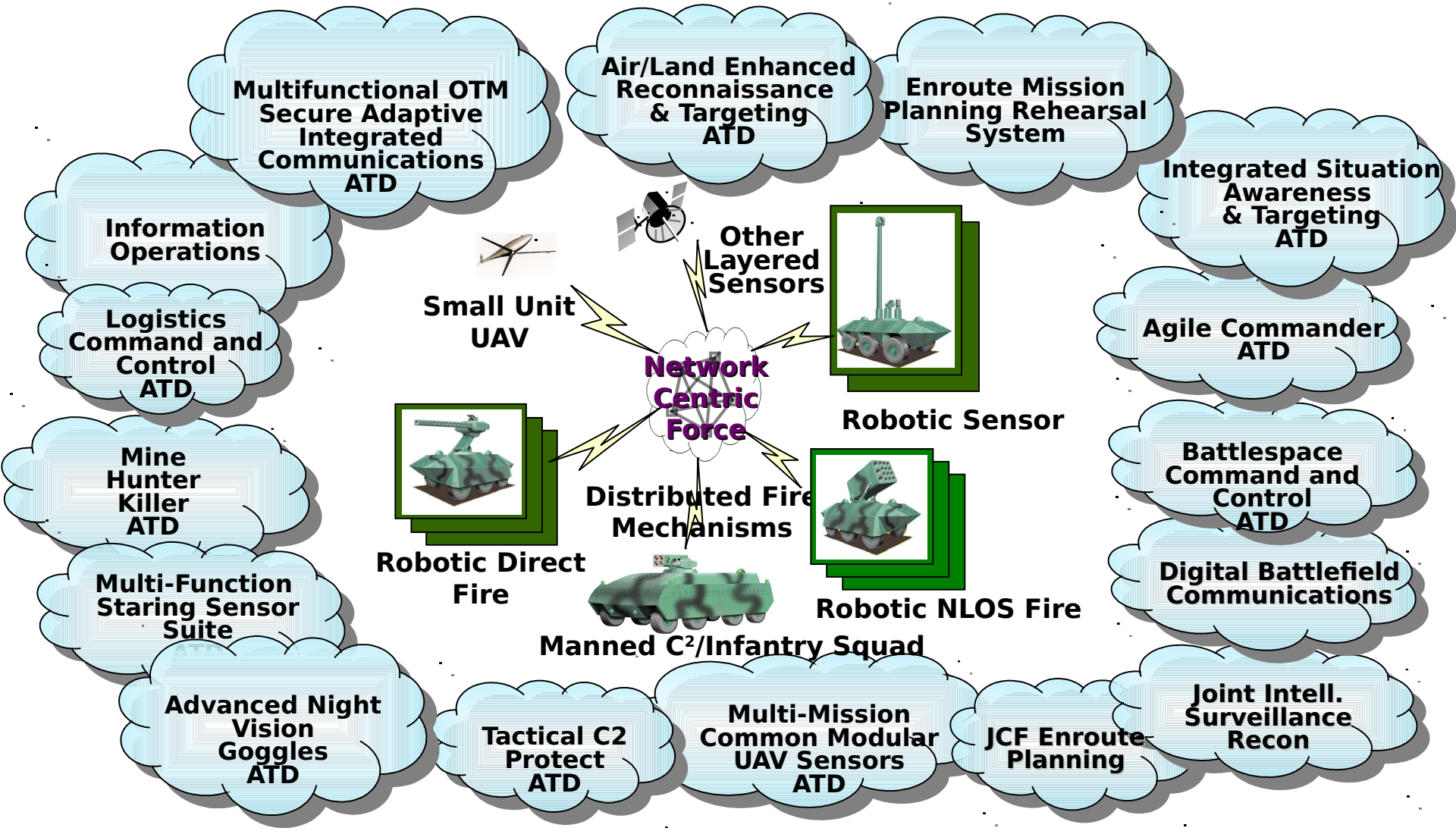
**ECOM Bottom Line: THE WARFIGHTE**

# C4ISR Technologies

# Supporting/Enabling the Future Combat System/ Objective Force

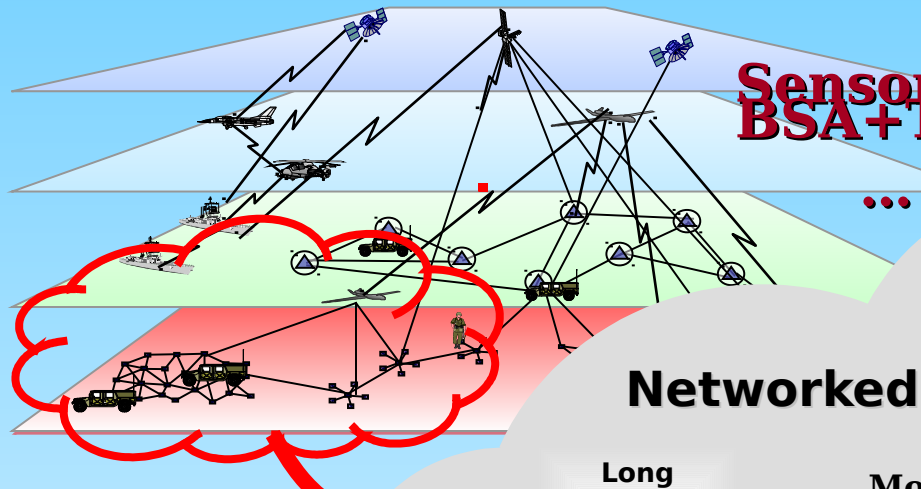
**CECOM Bottom Line: THE WARFIGHTER**

# CECOM ATDs and Programs


Multifunctional OTM Secure Adaptive Integrated Communications ATD
Air/Land Enhanced Reconnaissance & Targeting ATD
Enroute Mission Planning Rehearsal System
Integrated Situation Awareness & Targeting ATD
Information Operations
Logistics Command and Control ATD
Agile Commander ATD
Small Unit UAV
Other Layered Sensors
Network Centric Force
Robotic Sensor
Mine Hunter Killer ATD
Battlespace Command and Control ATD
Robotic Direct Fire
Distributed Fire Mechanisms
Robotic NLOS Fire
Multi-Function Staring Sensor Suite
Digital Battlefield Communications
Manned C²/Infantry Squad
Advanced Night Vision Goggles ATD
Tactical C2 Protect ATD
Multi-Mission Common Modular UAV Sensors ATD
JCF Enroute Planning
Joint Intell. Surveillance Recon

**ECOM Bottom Line: THE WARFIGHTE**

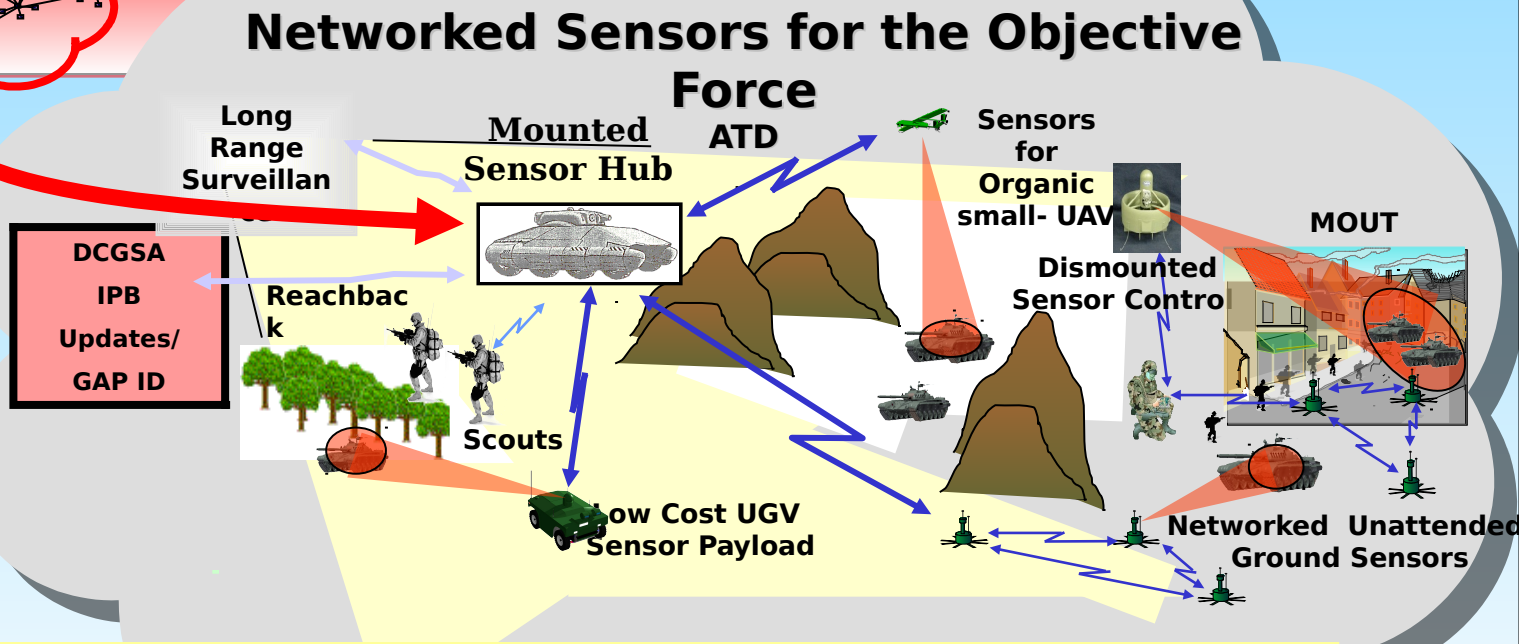
# Networked Sensors for the Objective Force



## Sensors for the Close Fight – BSA+T

## … Inside the extended Red Zone

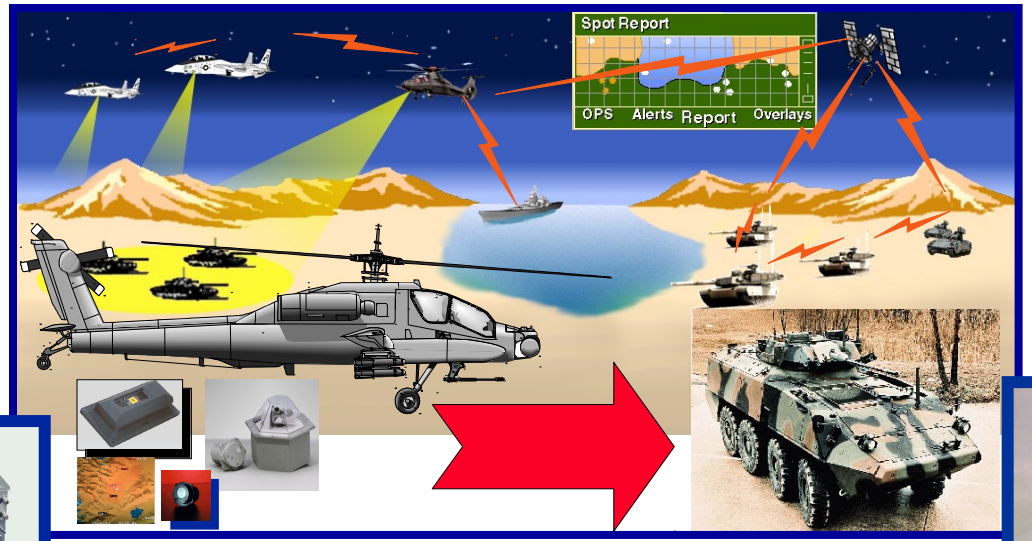
***Organic Low Cost Unmanned Sensors for the Battlefield Commander***



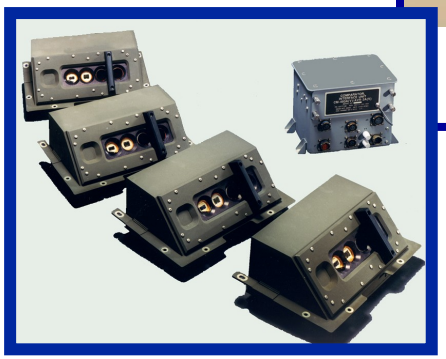

**Distributed Sensors Fill the Battlefield Situational Awareness Gap and Provide BLOS Targeting**

***– Complement Global Surveillance –***

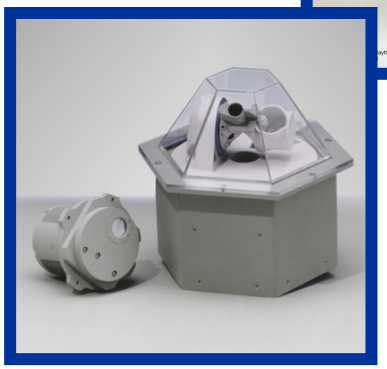
# Migration of Aircraft IR Missile Countermeasures and Laser Warning to Objective Force




- Leverages Successful ATIRCM Program



- IR SAM CM
- Laser Warning



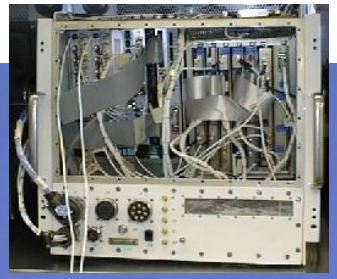
- ATGM CM
- Laser Warning

**ECOM Bottom Line: THE WARFIGHTE**

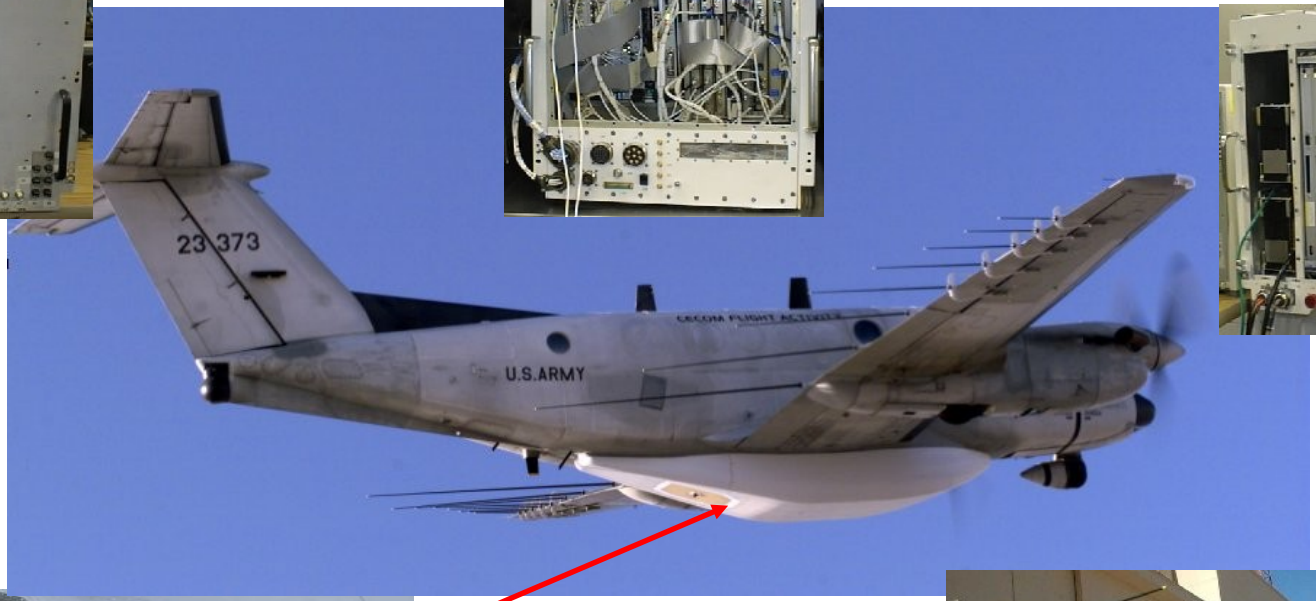
# FOPEN Installed on Army RC-12D

***Transmitter***
115 lb, 1600

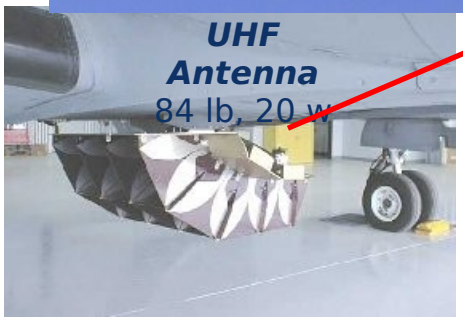
***Receiver / Exciter***



***Signal/Data Processor***
185 lb, 3270




***Cables***
15 lb



***UHF Antenna***
84 lb, 20 w

***GPS/INS***
19 lb, 56 w

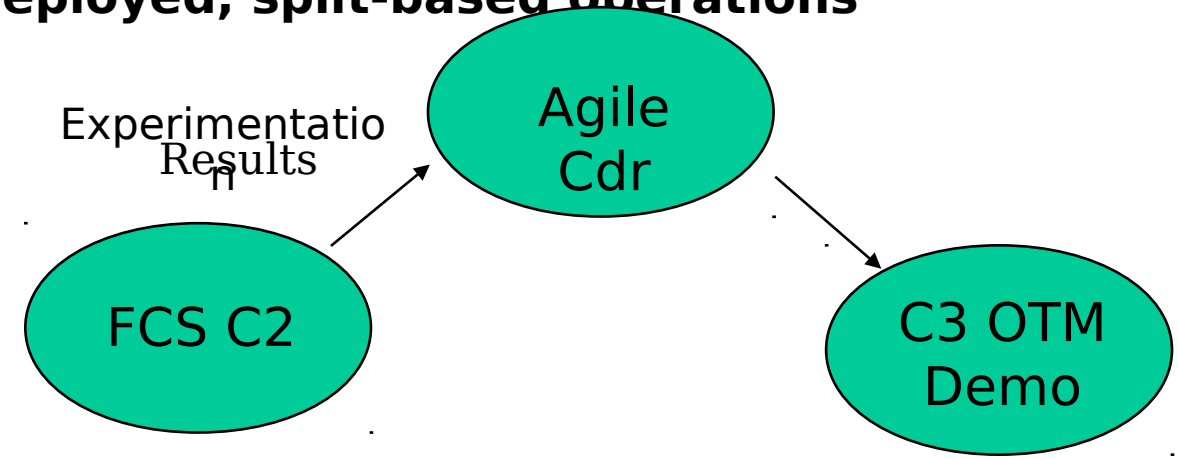
**ECOM Bottom Line: THE WARFIGHTE**

# Agile Commander ATD (III.C4.2000.01)

**Objective:** **Demonstrate information technologies enabling *execution-centric*, mobile command and control; aided by continuous battle planning and event control systems; engage in rapidly deployed, split-based operations**

**Transformation Payoff:**

- **Fully Integrated C2 System (Unit Cell & Above)**
  - **Maneuver**
  - **Logistics**
  - **Net Sensors/Fires**
- **B/W Adaptive Computing**
- **Technology Partners**
  - **Log C2 ATD**
  - **Mosaic ATD**




**Warfighter Payoffs:**

- **Mobile, integrated, distributed command-centric, near-real-time, semi-autonomous decision support system**

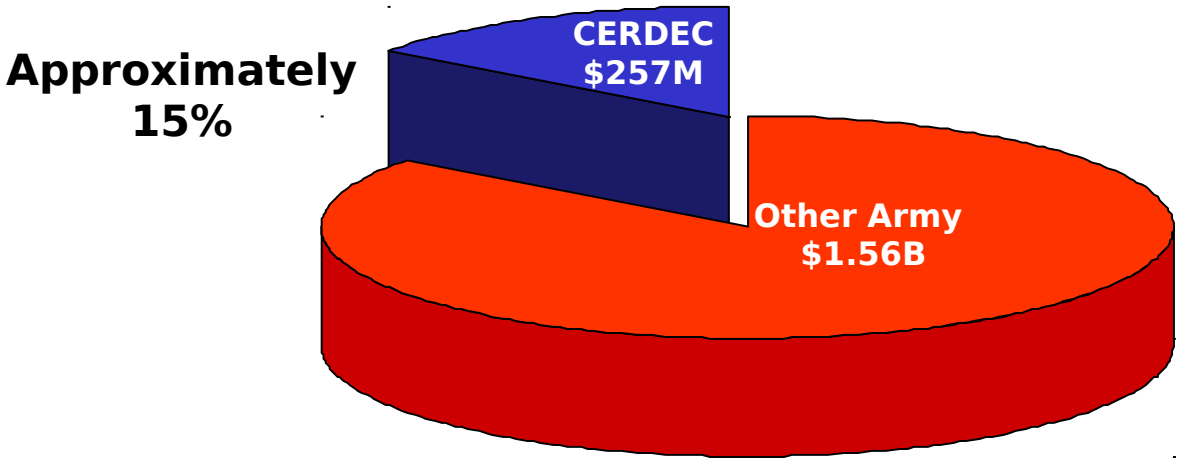
**Agile Commander supports the On-the-Move concept**

**ECOM Bottom Line: THE WARFIGHTE**

# RDEC Tech Base Funding

***C4ISR is beginning to be acknowledged as a key FCS/OBJ Force enabler***

***FY- 02 ARMY TOTAL 6.2 & 6.3 = $1.82B***

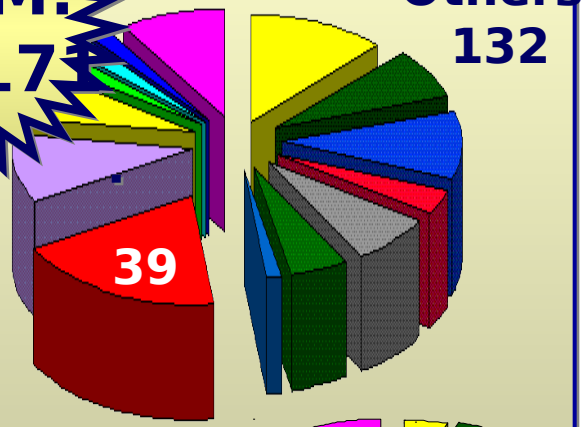



**ECOM Bottom Line: THE WARFIGHTE**

# FY02
# Defined Army Needs

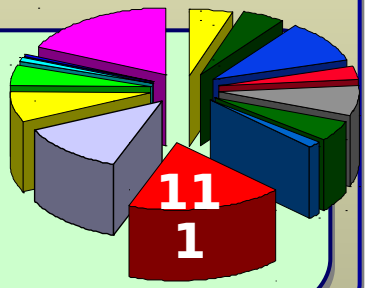
## STOs

CECOM: 39 of 175




CECOM
39

$ CECOM STO Dollars: $111 M




## ATDs

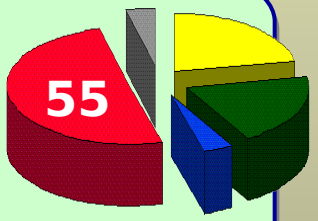
CECOM: 8 of 18

Others
10

8

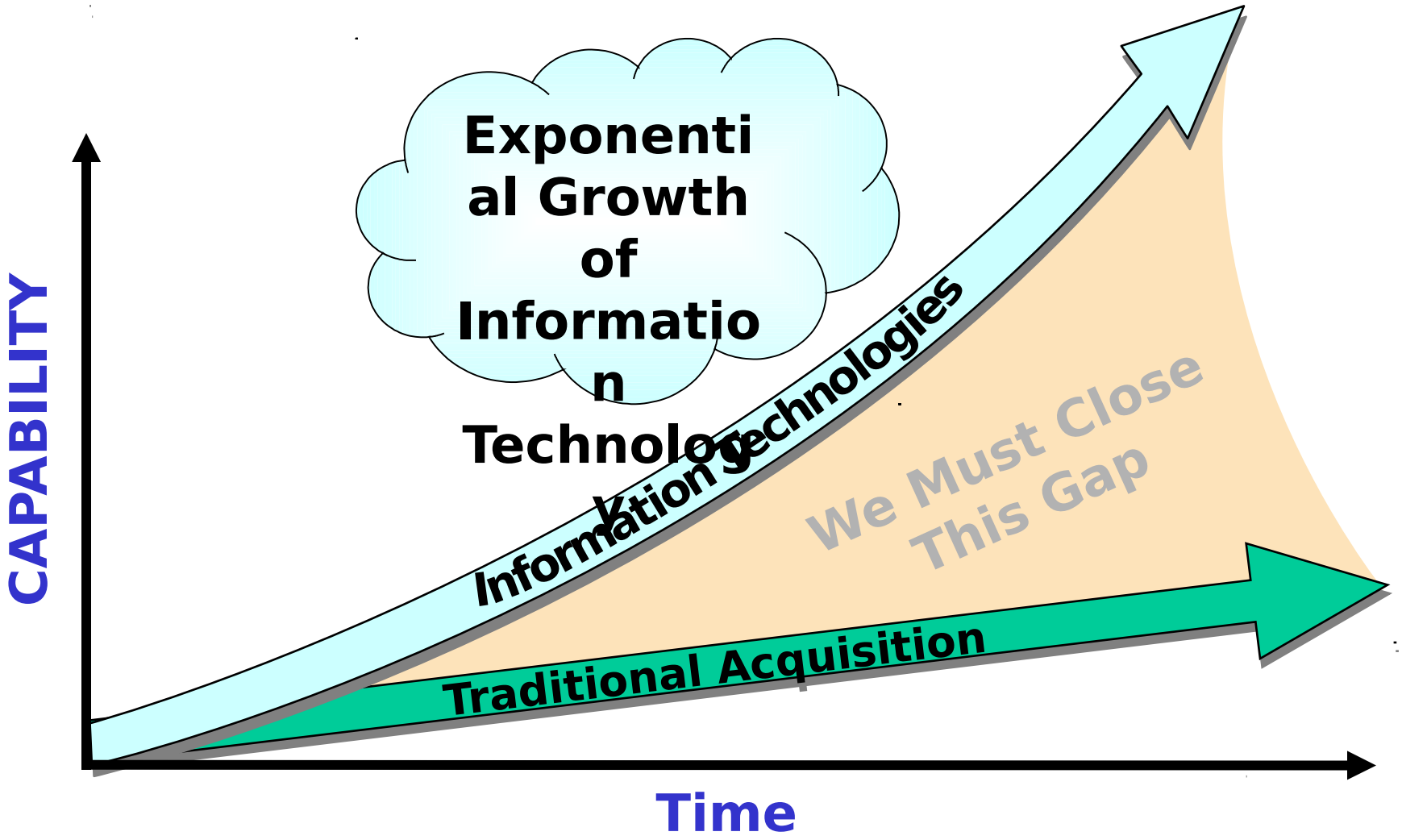
CECOM
8

$ CECOM ATD Dollars: $55 M



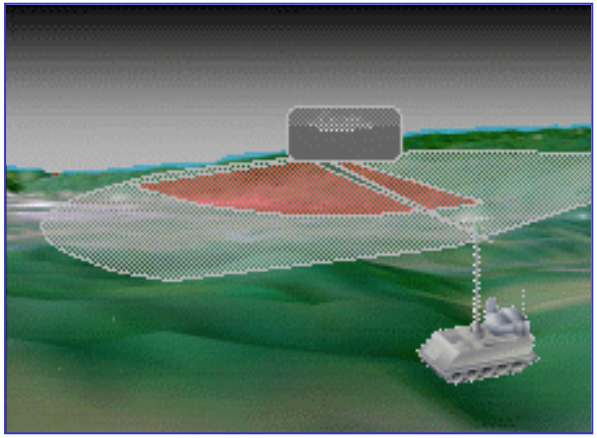

ECOM Bottom Line: THE WARFIGHTE

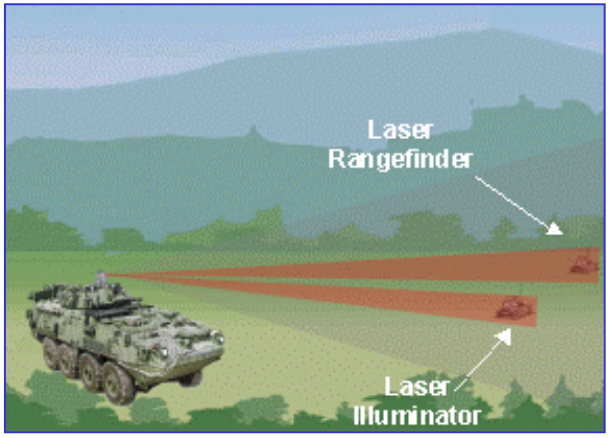
# Impact of Information Technology




**ECOM Bottom Line: THE WARFIGHTE**

# 2nd Generation FLIR





| 1984 | 1986 | 1990 | 1994 | 1998 | 2000 |
|---|---|---|---|---|---|
| 6.2 Technology Development | 6.3 Standardized Advanced Infrared Sensor Program | Standard Advanced Dewar Assembly Development | EMD | Production | Fielding |

**16 Years**

**ECOM Bottom Line: THE WARFIGHTE**

# Recent Examples of Rapid Prototyping

- **CECOM has a proven track record of quickly supporting PM & Customer Requirement**
- **Recent examples include:**
  - **Brigade Subscriber Node (BSN)**
  - **Multi Media Comms System**
  - **Land Warrior**
  - **Enroute Mission Planning & Rehearsal System (EMPRS)**
  - **Signals Intelligence (SIGINT) QRC.**
  - **Trojan Light**
  - **Measurement & Signature Intelligence (MASINT) Vehicle**
  - **Maneuver Control Systems (MCS) Light**

# C4ISR is the Key to Battlefield Success

- **C4ISR supports all critical combat operations**
- **C4ISR technologies mature more rapidly than platform/ weapons technologies**
- **Multiple opportunities for technology insertions exist in all three Transformation axes**

**SEE FIRST**

**DECIDE FIRST**

**SHOOT FIRST**

# The Intent of the Office of Homeland Security

**"To take *all* the technology assets that we have in Government and elsewhere and use them in such a way, *fuse* the information in such a way, *share the information* in such a way that we can hopefully prevent future terrorist attacks"**

**Gov Ridge**
**Director Homeland Security**

# How C4ISR Relates to Homeland Security

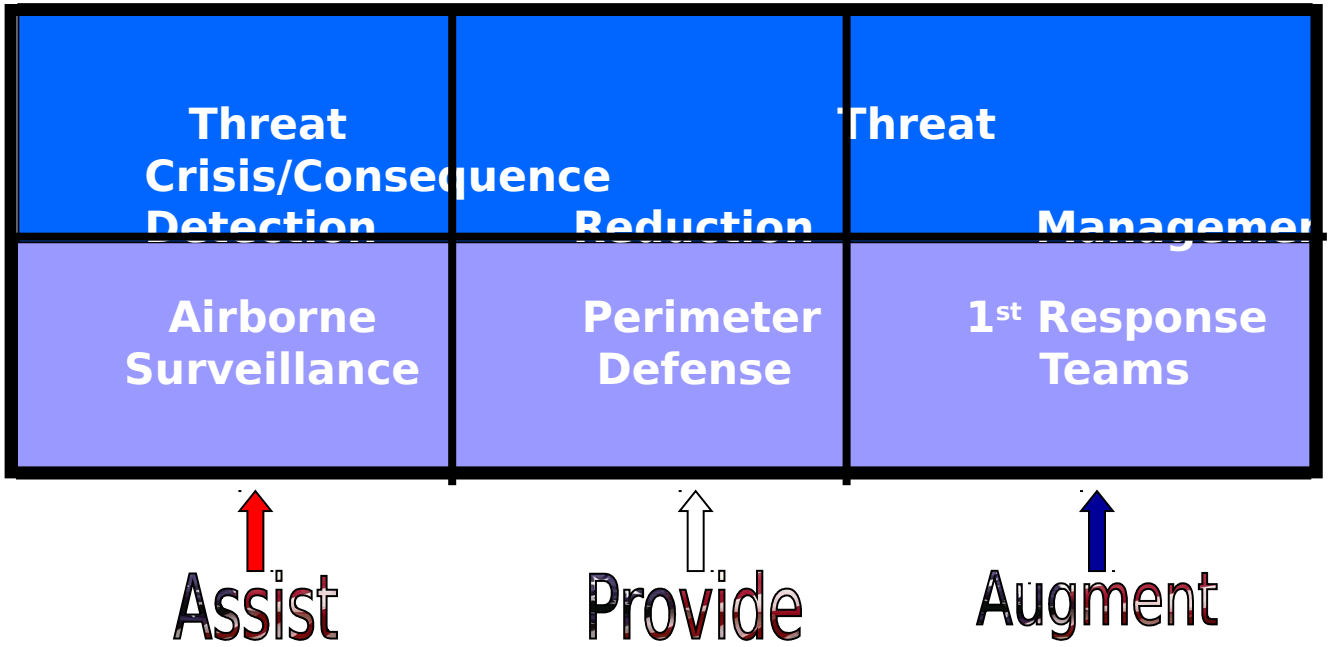
## CECOM Technology & Products

- **Airborne Sensors/Intelligence**
- **Mobile Command and Control**
- **Emergency Response**
  - Search & Rescue
- **Perimeter Security**
  - Intrusion Detection/Warning
  - Situational Awareness
- **Interoperable C4ISR Systems**
- **Reachback for Information Accessibility**

**Delivering The Right Info To Right Place At Right Time**

**CECOM Bottom Line: THE WARFIGHTE**

# Homeland Security




**CECOM can Contribute**
**And**
**Support the**

**Interoperability of Federal and State Civil Agencies**

**ECOM Bottom Line: THE WARFIGHTE**

# STATUS

- **Have not been tasked**
- **Do not have any HLS funding**
- **Legal issues need to be resolved**
  - **Military equipment to civilian agencies**
  - **May require new legislation**
- **1st Northeast Region Homeland Security Conference 9 through 13 Sep 02 at Atlantic City, NJ**

# RDEC Contract Opportunities Up to $8.7B

- **RDEC Wide Opportunities (up to $8.4B)**
  - **Small Business Innovation Research**
  - **Rapid Response II**

- **Specific Business Areas Opportunities (up to $326M)**
  - **Intelligence & Information Warfare Dir. ($30M)**
  - **Space & Terrestrial Communications Dir. ($21M)**
  - **Command & Control Dir. ($14M)**
  - **Night Vision & Electronic Sensors Dir. ($261M)**



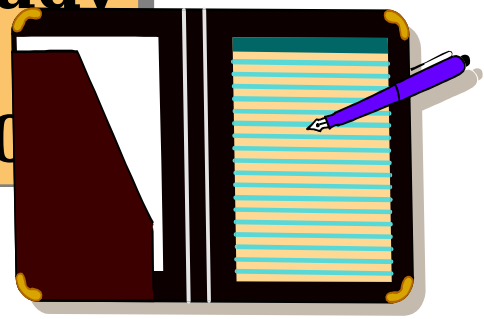
**ECOM Bottom Line: THE WARFIGHTE**

# Small Business Innovation Research

***FY02 Program* - 50 Topics**
***website:***
***http://www.acq.osd.mil/sadbu/sbir***

| | |
|---|---|
| Advanced Material & Manufacturing | 1 |
| Microelectronics & Photonics | 3 |
| Sensors & Information Processing | 2 |
| High Performance Computing & Simulation | 4 |
| Power & Directed Energy | 5 |
| Chem-Bio | 1 |
| Engineeri | |

## Phase I
**Feasibility Study**
**6 Months**
**NTE $100,00**



## Phase II
**R&D 2 Years**
**NTE**
**$750,000**

## Phase II Plus
**1 Year -**
**$100,000**
**Matching**

## Phase III
**Commercialization**
**Funding from**
**Non-SBIR Source**

**om Line: THE WARFIGHTE**

# Small Business Innovation Research

- **30 Topics published in the DoD 01.2 Program Solicitation**
- **245 Phase I Proposals were submitted against topics**
- **46 Phase I Proposals were selected for award – 18% of all proposals submitted**
- **26 Phase II Proposals were awarded this year – 57% of all Phase I proposals awarded**
- **Since inception in 1996, CECOM has won 5 of 6 annual Phase II Quality Awards**

**ECOM Bottom Line: THE WARFIGHTE**

# Phase III Success Story
# Virtual Breaker Box
# Custom Manufacturing and Engineering,

**Impact:**

- **1 Unit delivered, 8 units ordered, $32K in revenue, potential for 1000's to be used across DoD**
- **Two patents in process**
- **$2.25M in DoD research funding**
- **$35K in non-DoD research funding**

- *Through the use of "smart" circuits and outlets*
  - Delivers advanced energy management
  - Control for shelters and vehicles
- Applications
  - FCS
  - Multi-functional, low-power systems in Land Warrior
  - Unattended ground sensor networks
- Commercial applications
  - Yachts
  - RVs
  - Industrial buildings

**ECOM Bottom Line: THE WARFIGHTE**

# Small Business Innovation Research (SBIR) Program Opportunities

- **OBJECTIVE:** To stimulate technological innovation, strengthen role of small business in DoD R&D needs, foster & encourage participation by minority/disadvantaged persons, increase commercial application of DoD supported research in R&D results.
- **CONTRACT TYPE:** Firm Fixed Price (FFP)
- **ESTIMATED VALUE:** Up to $5.3M
- **KEY MILESTONES:** (Phase I)
  - Pre-Solicitation 1 May 02
  - Solicitation Opens 1 Jul 02
  - Solicitation Closes 14 Aug 02
  - Contract Award 13 Dec 02
- **PROGRAM CONTACT:** Suzanne Weeks, (732) 427-3275
- **ACQUISITION CONTACT:** Rick Kolarsick, (732) 532-4246

Phase I Opportunities Now Available

# RAPID RESPONSE II

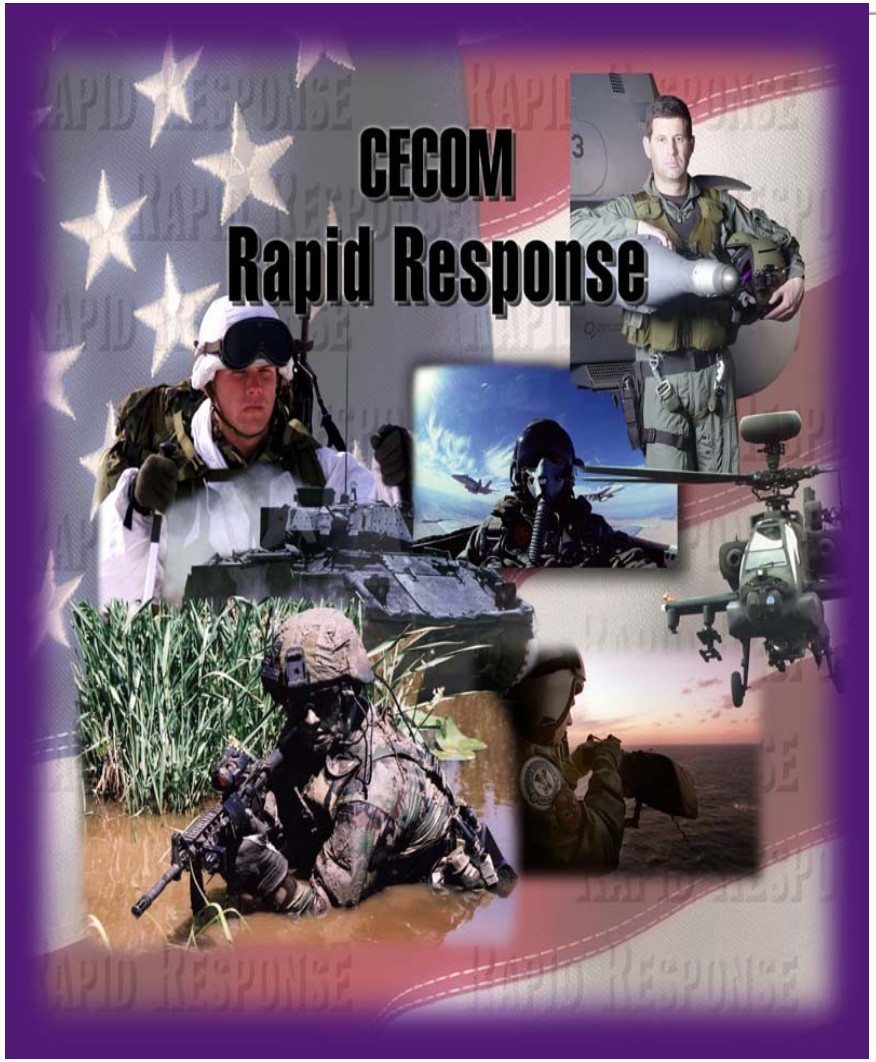
CECOM
RAPID RESPONSE PROJECT OFFICE
FORT MONMOUTH, NJ

R2 STATEMENT OF WORK AND CAPABILITIES

- **Broad Scope to Support All Platforms**
- **Technology Insertion**
- **Systems Integration**
- **Fabrication and Prototyping**
- **Testing**
- **Certification**
- **Studies and Analyses**
- **Technical Data Management**
- **Systems Installation**
- **Logistics Support Service**
- **Training**
- **Acquisition Support**

CUSTOMERS

- **US ARMY**
- **US AIR FORCE**
- **US NAVY**
- **US MARINE CORPS**
- **US COAST GUARD**
- **NASA**
- **Defense Logistics Agency**
- **FMS**
- **State Department**
- **Available to All Federal Agencies**




**CECOM Bottom Line: THE WARFIGHTE**

CECOM
RAPID RESPONSE PROJECT OFFICE
FORT MONMOUTH, NJ

R2 STREAMLINED ACQUISITION SOLUTIONS

- **19 Day Competitive Award Process**
- **Step-By-Step Technical/Contract/ Budget Assistance**
- **Three Multiple Award Task Order Contracts**
- **Flexible Time and Materials and Firm-Fixed-Price Orders**
- **Negotiated Labor Rates for Prime and Subcontractors**
- **Wide-Ranging Labor Categories**
- **Low 1% Management Fee**

R2 EXPERIENCED DEDICATED STAFF

- **Engineers**
- **Acquisition Professionals**
- **Computer Scientists**
- **Legal Representatives**
- **Small Business Specialists**
- **Budget Analysts**

# RAPID RESPONSE II

- **Recompete teams for Rapid Response to Critical Systems Requirements Contracts (R2CSR).**
- **Current 3 contracts expire in 07/03.**
- **Customers require greater period of performance.**
- **Awarded over 514 delivery orders for varied federal customers since 07/98.**
- **Value of Awards to Date:**
  - **Total: ~$1.45 Billion**
  - **Small Business: ~$370 Million**

# RAPID RESPONSE II

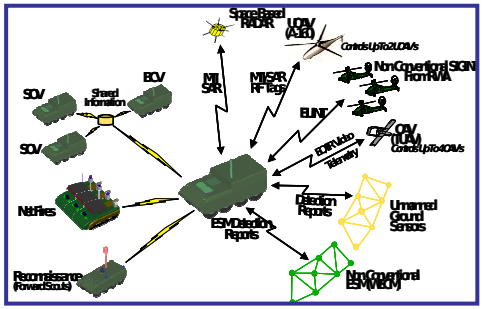
- **OBJECTIVE: Provide federal platform managers with a rapid means for acquiring integration, modification, testing, maintenance, logistics, etc. support.**
- **CONTRACT TYPE: Performance-Based Indefinite Delivery/Indefinite Quantity (ID/IQ) Time & Materials (T&M) / Firm Fixed Price (FFP).**
- **ESTIMATED VALUE: $2.8B Max Per Contract ($8.4B est. total)**
  **(8 Years Including Options)**
  **Potential for up to 7 contracts**
- **KEY MILESTONES:**

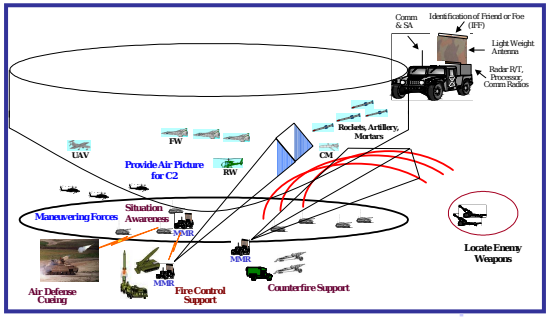
| | |
|---|---|
| **Release RFP** | **3Q FY02** |
| **Multiple Awards** | **4Q FY02** |

- **TECHNICAL CONTACT: Stanley Tylecki (732) 427-4348**
- **ACQUISITION CONTACT: Sylvia Mielke (732) 427-1519**
- **SOLICITATION NO: DAAB07-02-R-G401**

# Intelligence & Information Warfare Dir.
# Key Programs

## ISR



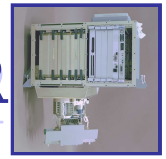


## Info Ops

## Multi-Mission Ra

## RADAR

FOPEN



SAR/MTI

MASINT

ACS

LCMR

## INTEL

MYSTIC

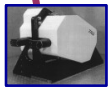
Future Capability

TUAV

COMMS

Improved EO/IR

SAR/MTI



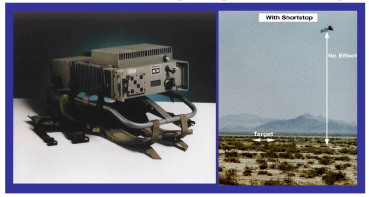
HSI

SIGINT

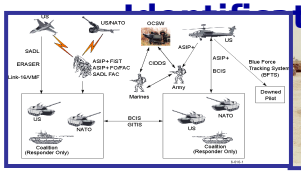
## Electronic Combat

Platform Protection

Area Protection




Combat Identification



# I2WD BAA - 11 Research Interest Topics

- Collect - Collection Systems -- General
- Collect - Signals Intelligence (SIGINT)
- Collect - Direction Finding (DF) Development and Enhancements
- Collect - Emitter Intercept Techniques
- Collect - Electronic Intelligence (ELINT)
- Collect - Measurement & Signature Intelligence (MASINT)
- Electronic Warfare (EW)
- Information Operations (IO) -- Attack
- Information Processing, Dissemination and Display
- Modeling and Simulation
- Command and Control Protect and C4-ISR Penetration Testing and Vulnerability Analyses

# Topic Details

- ***Topic title: Collect – Collection Systems -- General***
  - **Requirements**
  - **Technology forecast through 2010**
  - **Objectives**
  - **Revolutionary ISR capabilities required**

- ***Topic title: Collect – Signals Intelligence (SIGINT)***
  - **Future signals environment**
  - **Geographical considerations**
  - **Sensor requirements**

# Topic Details

- ***Topic title: Collect – Direction Finding (DF) Development and Enhancements***
  - **Super-resolution DF algorithms**
  - **Antenna array design**
  - **System calibration and electromagnetic modeling**
  - **RF interference**
  - **Critical component development**
  - **Real-time signal processing in embedded computers**
  - **Wide-band / LPI signal exploitation techniques**
  - **Issues peculiar to HFDF**

# Topic Details

- ***Topic Title: Collect – Emitter Intercept Techniques***
  - **Advanced receivers and receiving techniques**
  - **TTPs for automated intercept, processing and exploitation of Low Probability of Intercept (LPI), Low Probability of Exploitation (LPE) signals**
  - **Methods and techniques for improving the intercept range (distance) of ground based and low-flying intercept systems**
  - **Improvements in man-machine interfaces for tactical intercept systems**
  - **Recognition, demodulation, and decoding of digital data**

# Topic Details

- ***Topic Title: Collect – Electronic Intelligence (ELINT)***
  - **Sub-topic #1 - 6U VME ELINT Digital IF Receivers, Algorithms and Processors**
  - **Sub-topic #2 - Digital Broadband Cross-Ambiguity-Function Processor for ELINT Geolocation**

- ***Topic title: Collect – Measurement and Signature Intelligence (MASINT)***
  - **Sub-topic #1 – Combat Identification**
  - **Sub-topic #2 – Moving Target Indicator (MTI) / Synthetic Aperture RADAR (SAR)**
  - **Sub-topic #3 – System of Systems Integration of Delivery, Processing and Dissemination Systems**

# Topic Details

- ***Topic title: Electronic Warfare (EW)***
  - **Sub-topic #1 -- Communications Electronic Attack**
  - **Sub-topic #2 -- Infrared Countermeasures (IRCM)**
  - **Sub-topic #3 -- Multi-Spectral EO / IR / UV Sensors for Warning / Countermeasure**
  - **Sub-topic #4 -- Self Protection / Avionics Technology**
  - **Sub-topic #5 -- RADAR Countermeasures, Warning and Deception**
  - **Sub-topic #6 -- Advanced RADAR Countermeasures**
  - **Sub-topic #7 -- Electronic Deception & Advanced Signature Management**

# Topic Details

- ***Topic title: Information Operations (IO) -- Attack***
  - **C4-ISR Exploitation and Attack (Counter C4-ISR) Requirements:**
  - **Sub-topic #1: Real Time, Stealthy, Logical Network Access, Discovery, Exploitation and Countermeasures– non-cooperative**
  - **Sub-topic #2: Real Time, Stealthy, RF Access, Communications and Non-Communications Network Discovery, Exploitation and Countermeasures – non-cooperative**
  - **Sub-topic #3: Real Time, Stealthy, Active Protection and Defense of U.S. Army Tactical Information Networks; Exploitation and Countermeasures – cooperative**

# Topic Details

- ***Topic title: Information Processing, Dissemination and Display***
  - **Sub-topic #1 – Information Processing and Fusion**
  - **Sub-topic #2 – Multi-Sensor Fusion Automatic Target Recognition (ATR)**

- ***Topic title: Modeling and Simulation (M&S) Initiatives***
  - **Electronic Warfare Systems Modeling and Simulation**
  - **Communications Intelligence System Simulation Collection Used for Opposing Wireless Communications Systems**
  - **IEW / IO Mission Planner**

# Topic Details

- ***Topic title: Command and Control Protect and C4-ISR Penetration Testing and Vulnerability Analyses***
  - Vulnerabilities of U.S. C2 or C4-ISR systems or their components shall be classified SECRET.
  - Vulnerability assessments, penetration testing, exploitation, countermeasure development, or the development of tactics, techniques and procedures, having a focus that is Threat / adversary-based, shall not be undertaken under this topic.
  - No classified materials, software, tools, tactics, techniques or procedures shall be developed under this topic.
  - Classified tools for Information Operations shall be developed under the IO Attack topic and sub-topics of this BAA.
  - Contractors working under this topic shall not have access to classified tools.

# I2WD BAA 2000

- **OBJECTIVE: Open solicitation wherein special consideration shall be given to R&D proposals that exhibit revolutionary and innovative solutions that satisfy Army requirements in the areas of Information Superiority and Information Dominance based upon available funding.**
- **CONTRACT TYPE: Cost Plus Fixed Fee (CPFF)**
- **ESTIMATED VALUE: Total Awards $25M-$30M**

  **Individual Awards $500K - $20M**
- **KEY MILESTONES: Various annual awards (FY03-FY05)**

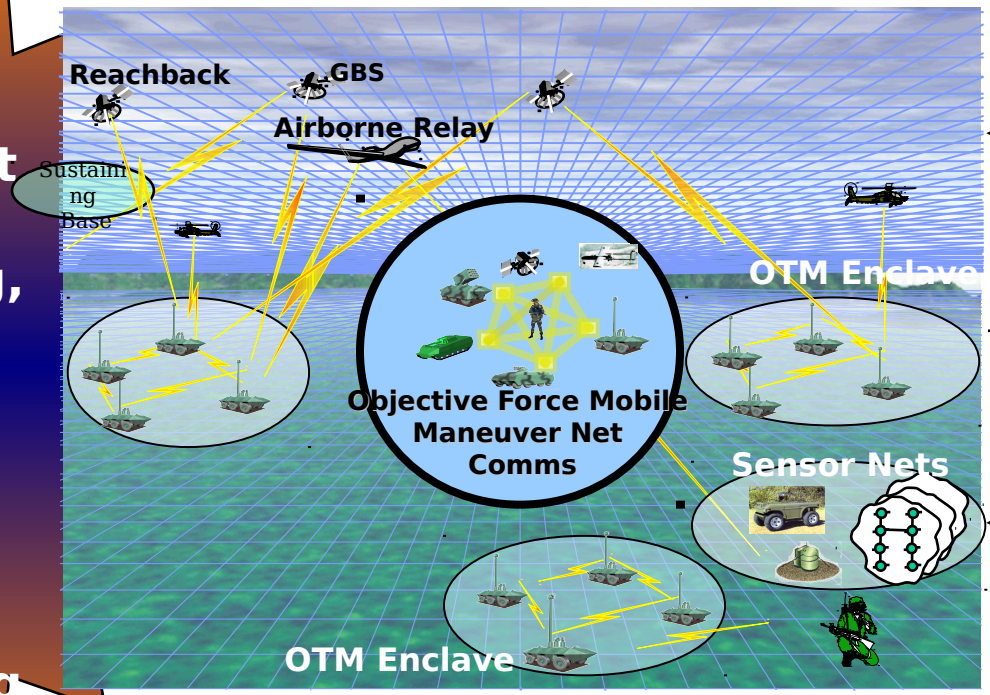
  **Open proposal submission accepted at anytime throughout life of BAA**
- **TECHNICAL CONTACT: Mary Wills, (732) 427-7206**
- **ACQUISITION CONTACT: Mary Paterno-Mihalko, (732) 532-3992**
- **SOLICITATION # : DAAB07-00-R-K501**



**ECOM Bottom Line: THE WARFIGHTE**

# Multifunctional On-the-Move Secure Adaptive Integrated Communications (MOSAIC)

Adaptive Network Protocols to Support Self-Initializing, Self-Healing, Adaptive, Mobile Networks while addressing security




Bandwidth Management

Security Framework

***Communications Support for Increased Operational Flexibility***

**ECOM Bottom Line: THE WARFIGHTE**

# Multifunctional On-the-Move Secure Adaptive Integrated Communications (MOSAIC)

- **Major Focus Areas:**
  - **Bandwidth Management**
  - **Adaptive Network Protocols**
  - **Integration of Commercial and DoD developed wireless technologies**

- **Challenge:**
  - **Provide assured, wireless, network that works in diverse, complex terrain**

# Multifunctional On-the-Move Secure Adaptive Integrated Communications (MOSAIC)

- **Barriers:**
  - Days to preplan & configure network
  - Limited bandwidth for assured network access, services, & speed of delivery
  - Complex, dynamic, network management
  - Continuous coverage
- **Solutions:**
  - Minutes to configure network via self-organizing Ad Hoc protocols
  - Efficient bandwidth utilization via adaptive algorithms
  - Simplified automated network opns using intelligent distributed agents
  - Horizontal and vertical network handoff (including UAV Comms payload)

**ECOM Bottom Line: THE WARFIGHTE**

# Multifunctional On-the-Move Secure Adaptive Integrated Communications (MOSAIC)

- **OBJECTIVE: To provide mobile communications and networking technologies to support the Objective Force/Future Combat Systems and Battle Command infrastructure mobility**
- **CONTRACT TYPE: Combination of Other Transactions, Cost Plus Fixed Fee, (BAA)**
- **ESTIMATED VALUE: $3 - 5M over 2 years**
- **KEY MILESTONES:**
  - **BAA Released: 3QFY00**
  - **Multiple Awards 1QFY03 & 2QFY04**
    **(Suggested proposal submission NLT Aug 02 and Nov 03 respectively)**
  - **Final Demonstration FY04**
- **TECHNICAL CONTACT: Gary Blohm, (732) 427-4277**
- **ACQUISITION CONTACT: Frederick Kolarsick, (732) 532-4346**
- **SOLICITATION NO: DAAB07-00-R-L575**

**ECOM Bottom Line: THE WARFIGHTE**

# Advanced Antennas

WIDEBAND GAP-
- OTM MULTIMISSION
- HIGH DATA RATE

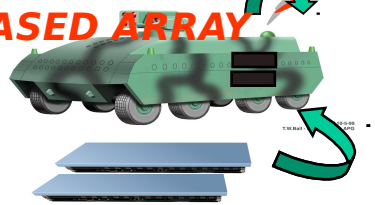
MILSTAR

GLOBAL BROADCAST SATELLITE

NEAR FIELD ANTENNNA / PLATFORM MODELING

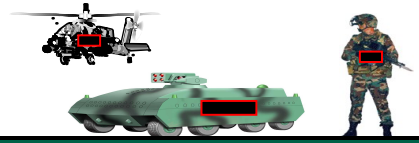
- REDUCED ANTENNA PATTERN DISTORTION

OTM MULTIBEAM PHASED ARRAY



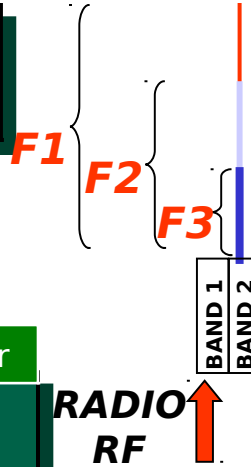
RECEIVE AND TRANSMIT ARRAYS

BODY BORNE / LOW PROFILE ANTENNAS



- REDUCED VISUAL SIGNATURE
- ENHANCED SURVIVABILITY / HORIZONTAL TECH INTEGRATION

RECONFIGURABLE VHF & MULTIBAND BAND SWITCHED



- JTRS INTEGRATION

JOINT TACTICAL RADIO SYSTEM OTM MULTIBAND ANTENNA



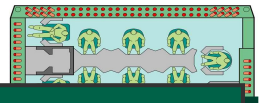
JTRS | Wideband Phased Array | Multiplexer

ED

COSITE
- GREATER GAIN

RADIO RF

RADIO CONTROL



- REDUCED LOGISTICS

ECOM Bottom Line: THE WARFIGHTE

# Advanced Antennas

- **Major Focus Areas:**
  - **Multiband, Multibeam phased-array antennas**
  - **Re-configurable band-switched antennas**
  - **Multiband antennas for ground and airborne JTRS radio applications**
  - **Body borne & low-profile antennas for soldier and Vehicular platforms**
  - **Modeling and Simulation to validate antenna design efforts**

- **Challenge:**
  - **Develop antenna products that provide mobility, robustness, interference rejection and form factors required for Objective Force Communications**

# Advanced Antennas

- **Barriers:**
  - **Reducing antenna size while maintaining bandwidth**
  - **Improving G/T to achieve higher data rates**
  - **Maintaining uniform antenna VSWR and gain across band**
  - **Reducing interference**

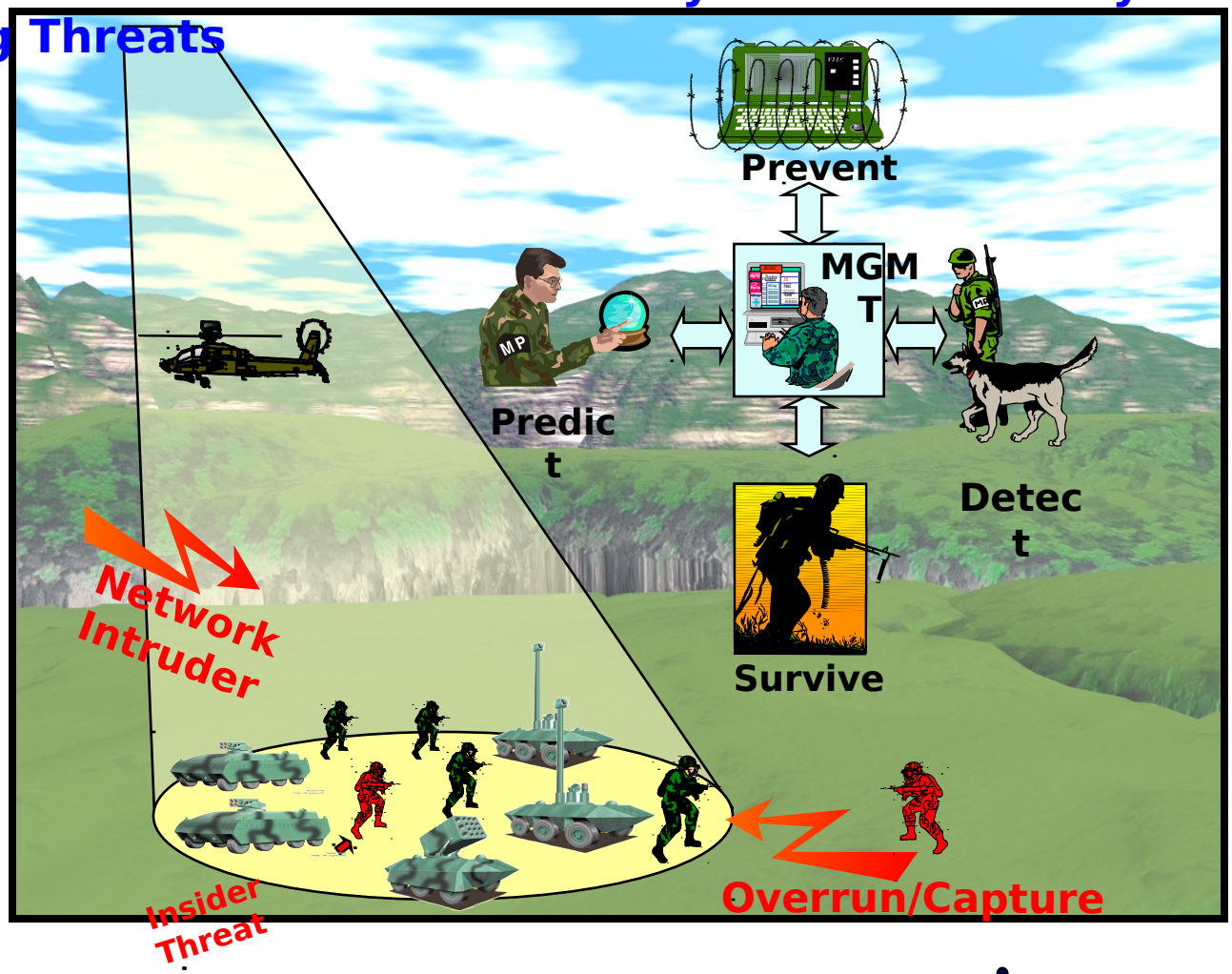
- **Solutions:**
  - **Apply thin film ferroelectric and MEMS technologies**
  - **Develop slow wave spiral antenna technologies**
  - **Develop reconfigurable band switching technologies**

# Advanced Antennas

- **OBJECTIVE: To develop a family of OTM, high gain, low profile antennas and subordinate products covering the 30 MHz to 44 GHz frequency range**
- **CONTRACT TYPE: Combination of Other Transactions, Cost Plus Fixed Fee, Firm Fixed Price, (BAA)**
- **ESTIMATED VALUE: $8 - $13M, 5 year effort**
- **KEY MILESTONES:**
  - **BAA Released 3QFY00**
  - **Multiple Awards 2QFY03, 2QFY04**
    **(Suggested proposal submission NLT Nov 02 and Nov 03 respectively)**
  - **Prototype Delivery 2QFY03, 2QFY04, 2QFY05, 4QFY06**
- **TECHNICAL CONTACT: Steve Goodall (732) 532-0445**
- **ACQUISITION CONTACT: Virginia Knight (732) 532-4348**
- **SOLICITATION NO: DAAB07-00-R-L575**

# Tactical Information Assurance Technology

**Objective: Adapt and Develop Critical Information Assurance Component to Insure Network and System Availability Despite Increasing Threats**




**ECOM Bottom Line: THE WARFIGHTE**

# Tactical Information Assurance Technology

- **Major Focus Areas:**
  - **Advanced Network Access Control**
  - **Wireless Intrusion Detection**
  - **Synchronized Security Management**
  - **Tactical Public Key Infrastructure**
  - **Mobile Code Authentication**

- **Challenge:**
  - **Inability to protect the Wireless Tactical Networks of the Future Combat Systems and the Objective Force from increasingly sophisticated, organized nation state threats**



**ECOM Bottom Line: THE WARFIGHTE**

# Tactical Information Assurance Technology

- **Barriers:**
  - **COTS/GOTS products and developments not compatible with Wireless Tactical Networks**
  - **Information Assurance solutions do not exist for Tactical Wireless**
  - **Lack of integrated Automated Security Management Tools**
  - **Ad Hoc Network complicates authentication**

- **Solutions:**
  - **Smart Adaptation of commercial and Government based tools**
  - **Adopt, Adapt and Develop advanced tactical software protection tools and techniques**

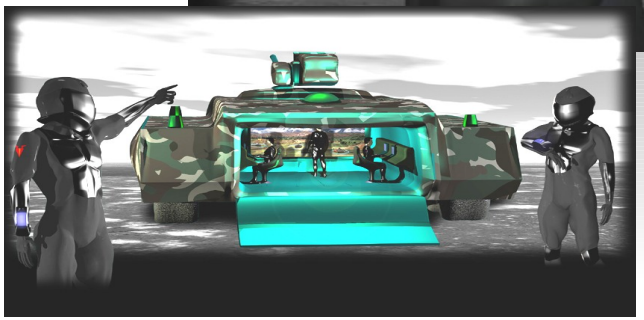
# Tactical Information Assurance Technology

- **OBJECTIVE: To advance the state of the art in wireless tactical protect tools and architecture concepts to enhance the security of the Objective Force**
- **CONTRACT TYPE: Combination of Other Transactions, Cost Plus Fixed Fee (BAA)**
- **ESTIMATED VALUE: $1- 3M, FY03-07**
- **KEY MILESTONES:**
  - **BAA Released 3QFY00**
  - **Call for White Papers 3QFY02 (22 May)**
  - **White Papers Due 3QFY02 (28 June)**
  - **BAA Proposals 4QFY02**
  - **Multiple BAA Awards 1QFY03**

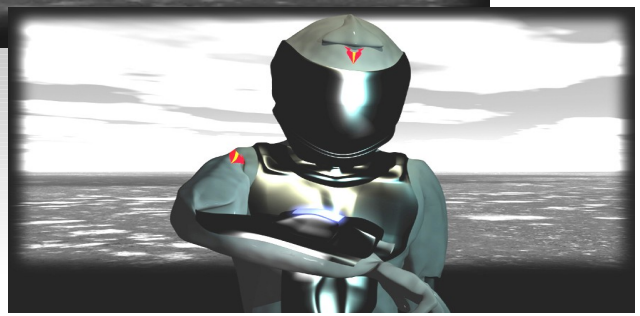
- **TECHNICAL CONTACT: Robert Schenk (732) 427-2069**
- **ACQUISITION CONTACT: Frederick Kolarsick (732) 532-4346**
- **SOLICITATION NO: DAAB07-00-R-L575**

# Agile Commander Advanced Technology Demonstration

## Execution-Centric Decision Support



**Mobile**
**Distributed**
**Collaborative**



**ECOM Bottom Line: THE WARFIGHTE**

# Agile Commander Advanced Technology Demonstration

- **Goals**
  - **Simplify and reduce the time required to plan operations**
  - **Ensure that relevant information is available to warfighters in a timely and common-sense manner**
  - **Create or mature C2 systems to aid the commander and his staff to conduct operations on-the-move**
- **Program Characteristics**
  - **Split-based, distributed battle command that sustains mobile, synchronized and coordinated operations from dispersed locations**
  - **Collaboration, visualization, and semi-automated Course of Action (COA) tools**
  - **Knowledge management and data warehousing**
  - **Software intelligent agents for execution monitoring**
  - **Integration of maneuver and logistics planning**



**ECOM Bottom Line: THE WARFIGHTE**

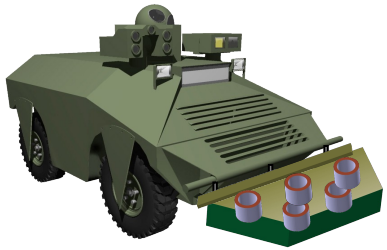
# Agile Commander Advanced Technology Demonstration

- **OBJECTIVE: Technical Research & Development support to the Agile Commander ATD in the areas of:**
  - **Course of Action (COA) / Continuous Planning**
  - **Intelligent Agents**
  - **Interactive Information Visualization**
  - **Knowledge Management and Warehousing**
  - **Modeling & Simulation**
  - **Adaptive Applications**
- **CONTRACT TYPE: Anticipate cost-plus-fixed-fee (offers may propose alternate contract types), BAA**
- **ESTIMATED VALUE: Individual awards from $25K to $3M**
  **Total Estimated Value - $14M**
- **KEY MILESTONES: Solicitation Published: 8 Aug 00**
  **Proposal Deadline for FY02 Award: 15 May 02**
  **Solicitation Closes: 30 Sep 03**
- **TECHNICAL CONTACT: Varies by topic area; identified in the BAA**
- **ACQUISITION CONTACT: Mr. Andrew Dellomo (732) 532-3569**
- **SOLICITATION #: DAAB07-00-R-L613**

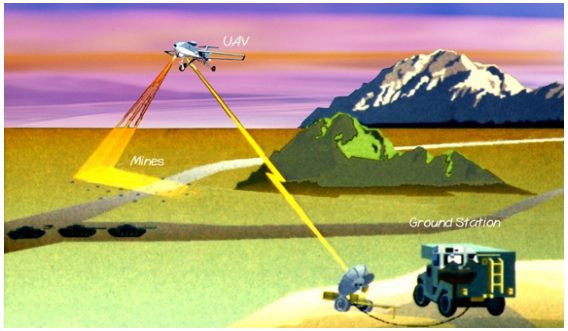


**ECOM Bottom Line: THE WARFIGHTE**

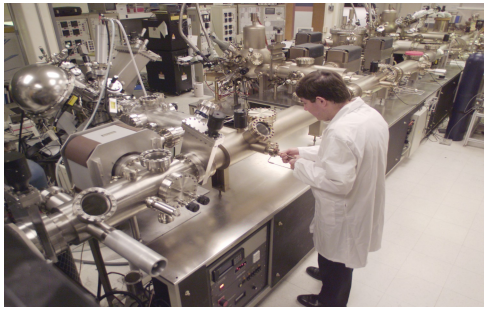
# High Tech Omnibus Contract
## Night Vision & Electronic Sensors Dir. (NVESD)



False Alarm Reduction




Lightweight Airborne Multispectral Minefield Detection



Microfactory

Mine Detection

Fabrication and Testing

Paint the Night Simulations

Multisensor Fusion Processor

320x240 Uncooled μ FLIRs

Modeling and Simulation

Sensor Development

**ECOM Bottom Line: THE WARFIGHTE**

# High Tech Omnibus Contract
## Night Vision & Electronic Sensors Dir. (NVESD)

- To provide technical, non-personal services for one year with four option years
- Includes R&D for night vision, electronic sensors, and mine detection and systems
- Requires scientists, engineers, computer specialists and other technical experts
- Supports design, fabrication, lab and field testing, and modeling and simulation
- Requires on-site management at Ft. Belvoir, VA



ECOM Bottom Line: THE WARFIGHTE

# High Tech Omnibus Contract
## Night Vision & Electronic Sensors Dir. (NVESD)

- **The two High Tech Omnibus Contractors may compete with each other for numerous task orders as needs arise.**
- **Funding levels achieved for each contractor depend on NVESD needs, funding available, and on number of winning task order bids.**
- **Contract includes materials purchases, management of subcontractors, and execution of R&D tasks both on-site at Ft. Belvoir, VA, and off-site to complete specific task orders.**
- **Requires clearances for all on-site personnel and off-site technical employees.**

# High Tech Omnibus Contract NVESD

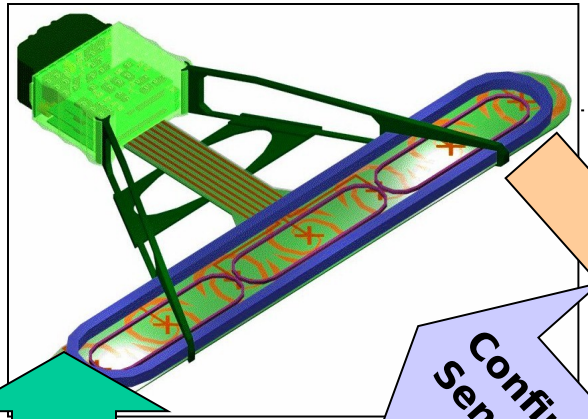
- **OBJECTIVE: Services contract for sensor technologies and prototypes**
- **CONTRACT TYPE: Indefinite del/indefinite quantity, time & materials**
- **ESTIMATED VALUE: Dual award of $15-$25M each with 4 option years at $15-$25M per year (total $250M)**
- **KEY MILESTONES: Solicitation 4QFY02**
  **Award 1QFY03**
- **TECHNICAL CONTACT: Susie McDowell 703-704-1252**
- **ACQUISITION CONTACT: Rick Forsberg 732-532-3547**
- **SOLICITATION # or RFQ #: TBD**

# Autonomous Mine Detection Sensors

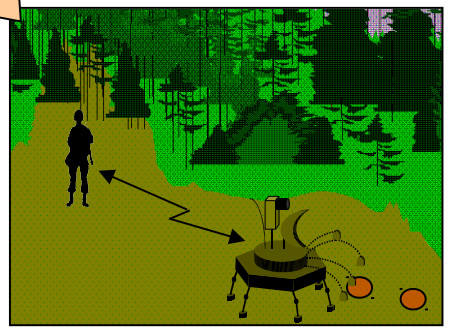
**Phase 1: Autonomous Mine Detection Sensors, FY02-04**

**Select Platform**

**Adv Signal Processing, Fusion, ATR Algorithms**

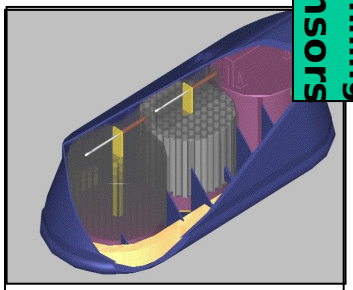


**Phase 2: Robotic Platform Integration, ATR Implementation, Test and Evaluation, FY04-07**

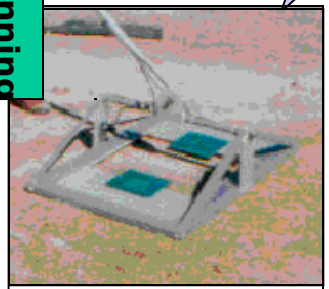


**Scanning Sensors**

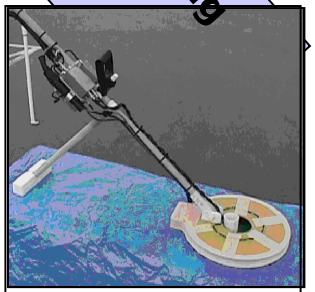
**Confirming Sensor**



GPR (HSTAMIDS)



Adv EMI (TEMID)



QR (ONR Prog)

**ECOM Bottom Line: THE WARFIGHTE**

# Autonomous Mine Detection Sensors

- **Develop and demonstrate mine detection sensors and software for autonomous cueing of targets**
- **May include various types of sensors (Ground-penetrating radar, infrared, acoustics, magnetic, chemical, quadrupole resonance, etc)**
- **Configurable for robotic standoff applications**
- **Major investment in aided target recognition algorithms for autonomous detection of anti-personal mines**

# Autonomous Mine Detection Sensors

- **OBJECTIVE: Develop and demonstrate mine detection sensors suite for autonomous platform**
- **CONTRACT TYPE: Cost Plus Fixed Fee**
- **ESTIMATED VALUE: $9-11M total for multiple contracts**
- **KEY MILESTONES: 3QFY02 BAA for white papers & demo**
  **1QFY03 solicitation**
  **2QFY03 award**
  **FY04 deliver prototype & downselect**
  **FY07 demonstration**
- **TECHNICAL CONTACT: Tom Becker 703-704-1255**
- **ACQUISITION CONTACT: Rick Forsberg 732-532-3547**
- **SOLICITATION # or RFQ#: TBD**

# SUBJECT MATTER EXPERTS

## *MANAGERS AVAILABLE AT CECOM EXHIBITS*

- **SMALL BUSINESS INNOVATION RESEARCH (SBIR)**
  **Suzanne Weeks, 732 427-3275**
  **Email**
  **Suzanne.Weeks@mail1.monmouth.army.mil**

- **INDEPENDENT RESEARCH & DEVELOPMENT (IR&D)**
  **Barbara Hartley, 732 532-0353**
  **Email**
  **Barbara.Hartley@mail1.monmouth.army.mil**

- **COOPERATIVE R&D AGREEMENTS (CRDAs)**
  **Randolph Jackson, 732 532-0364**
  **Email**
  **Randolph.Jackson12@mail1.monmouth.army.mil**

# WEBSITES

- **Broad Area Announcement (BAA):**
  **http://abop.monmouth.army.mil/**
  **Go to *New User Registration* to enroll to view solicitations, etc.**

- **Small Business Innovation Research (SBIR)Program:**
  **http://www.acq.osd.mil/sadbu/sbir (Phase I Solicitation)**
  **http://www.aro.army.mil/arowash/rt/ (Phase II Plus)**

- **Independent Research & Development (IR&D)Program:**
  **http://www.dtic.mil/ird/**